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EXAMINER

DI GRAZIO, JEANNE A

ART UNIT PAPER NUMBER

2871

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/977,684

Applicant(s)

KIM, DONG-GYU

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Priority to Korean Patent Application No. 2001-052829 (Aug. 30, 2001) is claimed.

Response to Arguments

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendment of all claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6 rejected under 35 U.S.C. 102(e) as being anticipated by Ogura et al. (US 6,271,902 B1).

Per claim 1 (amended): Ogura has a substrate and a black matrix formed on the substrate (Figure 4, substrate 1, black matrix 3). Ogura has a plurality of color filters (G,B,R) formed on the color substrate (Figure 4) and a peripheral portion placed on the black matrix and thinner than the flat central portion (Figure 4). Common electrodes are typically formed on a color filter substrate (Please see Kim US 6,407,782 B1)(stating that “a typical LCD device includes upper and lower substrates with a liquid crystal layer interposed therebetween ... The upper substrate includes a color filter and a common electrode.”, Col. 1, Lines 19-22). Thus, common electrodes formed on a color filter layer are inherent.

Per claim 2 (amended): Ogura has the plurality of color filters comprise a first color filter and a second color filter neighboring and overlapping the first color filter over the black matrix (Figure 4).

Per claim 3 (amended): Ogura has the peripheral portion of the second color filter overlaps the peripheral portion of the first color filter (See Figure 4, G,B, and R).

Per claim 4 (amended): Ogura has the peripheral portion of the second color filter overlaps the peripheral portion and the central portion of the first color filter (Figure 3E for example).

Per claim 5 (amended): Ogura has prior art (Figure 18) that illustrates the plurality of color filters comprise a first color filter and a second color filter spaced apart from the first color filter with a predetermined distance therebetween (Figure 18, conventional art).

Per claim 6 (amended): Ogura illustrates the steps of forming a black matrix on a substrate (Figure 3A), sequentially forming a plurality of color filters on the substrate each color filter having a flat central portion and a peripheral portion placed on the black matrix and thinner than the central portion (Figures 3A-3G). As explained with reference to claim 1 above, common electrodes formed on a color filter substrate are inherent.

Claims 8 and 13 rejected under 35 U.S.C. 102(e) as being anticipated by Kim (US 6,407,782 B1).

Per claim 8 (amended): Referring to Figure 1: Kim has a substrate (11), a plurality of gate lines (13) formed on the substrate, a plurality of data lines (15) crossing over the gate lines (Col. 1, Lines 32-40), a plurality of pixel regions defined by the plurality of gate lines and the plurality of data lines, (Figure 1) a thin film transistor formed at each pixel region ("T"), a plurality of

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color filters, each having a flat central portion and a peripheral portion placed on the data lines and thinner than the central portion (See Figure 6d), a plurality of contact holes exposing the drain electrodes and pixel electrodes connected to the drain electrodes through contact holes (Col. 2, Lines 49-53).

Per claim 13 (amended): Kim has the steps of forming a plurality of gate lines on a substrate, forming a plurality of data lines on the substrate, wherein the plurality of gate lines and the plurality of data lines define a plurality of pixel regions, forming a thin film transistor in each pixel region, sequentially forming a plurality of color filters, each color filter having a flat central portion and a peripheral portion placed on the data lines and thinner than the central portion, forming a plurality of contact holes to expose drain electrodes of the thin film transistors, and forming a plurality of pixel electrodes connected to the drain electrodes through the contact holes (Col. 2, Lines 36-56). Furthermore, it is to be noted that Kim has the apparatus and steps as noted to eliminate the need for a black matrix because the gate and data lines perform a light blocking function of a black matrix (Id.).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. (US 6,271,902 B1) in view of Kim (US 6,407,782 B1).

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Per claims 1-5 (amended): Ogura has the following amended elements of claims 1-5: Ogura has a substrate and a black matrix formed on the substrate (Figure 4, substrate 1, black matrix 3). Ogura has a plurality of color filters (G,B,R) formed on the color substrate (Figure 4) and a peripheral portion placed on the black matrix and thinner than the flat central portion (Figure 4). Ogura has the plurality of color filters comprise a first color filter and a second color filter neighboring and overlapping the first color filter over the black matrix (Figure 4). Ogura has the peripheral portion of the second color filter overlaps the peripheral portion of the first color filter (See Figure 4, G,B, and R). Ogura has the peripheral portion of the second color filter overlaps the peripheral portion and the central portion of the first color filter (Figure 3E for example). Ogura has prior art (Figure 18) that illustrates the plurality of color filters comprise a first color filter and a second color filter spaced apart from the first color filter with a predetermined distance therebetween (Figure 18, conventional art). Ogura does not appear to specify that a common electrode is formed on the plurality of color filters; however, Kim teaches that LCDs typically have a common electrode on the color filter substrate (Col. 1, Lines 19-22). Common electrodes are typically formed on color filter substrates for their ability to apply a reference voltage. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Ogura in view of Kim to include a common electrode on the color filter substrate for a reference voltage and thus so that the LCD can operate.

Per claim 6 (amended): Ogura has the steps of forming a black matrix on a substrate (Figure 3A), sequentially forming a plurality of color filters on the substrate each color filter having a flat central portion and a peripheral portion placed on the black matrix and thinner than

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the central portion (Figures 3A-3G). Ogura does not appear to specify that a common electrode is formed on the plurality of color filters; however, Kim teaches that LCDs typically have a common electrode on the color filter substrate (Col. 1, Lines 19-22). Common electrodes are typically formed on color filter substrates for their ability to apply a reference voltage. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Ogura in view of Kim to include a common electrode on the color filter substrate for a reference voltage and thus so that the LCD can operate.

Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. (US 6,271,902 B1) and Kim (US 6,407,782 B1) as applied to claims 1-6 above and further in view of Nakamura et al. (US 5,725,975).

Per claim 7 (amended): Ogura, as noted, has the step of sequentially forming the plurality of color filters (Figures 3A to 3G), forming a color filter material over the substrate (Figures 3A to 3G). Ogura does not appear to have the steps of patterning the color filter material by using a mask having a transparent pattern, a semitransparent pattern and an opaque pattern, wherein the semitransparent pattern is used for forming the peripheral portions of each color filter; however, Nakamura teaches a gradation mask of three different regions varying in transparency (please see Figure 5B). In region “c” of Figure 5B, the transmittance of light of a wavelength of 365 nm was 100% while in region “b” transmittance was about 10% (Col. 6, Lines 30-37). Nakamura also teaches that this gradation mask is very suitable for the manufacturing of color filters comprising a plurality of colored pixels (Col. 6, Lines 61-63). The teaching of Nakamura suggests that this type of gradation mask is suitable for the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter,

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green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Ogura in view of Nakamura for the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks.

Claims 9-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US 6,407,782 B1) as applied to claim 8 above and further in view of Ogura et al. (US 6,271,902 B1).

Per claims 9-12 (amended): Kim does not appear to have a first color filter and a second color filter neighboring and overlapping the first color filter, the peripheral portion of the second color filter overlaps the peripheral portion of the first color filter, the peripheral portion of the second color filter overlaps the peripheral portion and the central portion of the first color filter, the second color filter is spaced apart from the first color filter with a predetermined distance therebetween; however, Ogura has the plurality of color filters comprise a first color filter and a second color filter neighboring and overlapping the first color filter (Figure 4). Ogura has the peripheral portion of the second color filter overlaps the peripheral portion of the first color filter (See Figure 4, G,B, and R). Ogura has the peripheral portion of the second color filter overlaps the peripheral portion and the central portion of the first color filter (Figure 3E for example). Ogura has prior art (Figure 18) that illustrates the plurality of color filters comprise a first color

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filter and a second color filter spaced apart from the first color filter with a predetermined distance therebetween (Figure 18, conventional art). The problem to be solved in Ogura is the improvement in contrast (Col. 2, Lines 64-66) and surface smoothness (Col. 6, Lines 20-25). Specifically, Ogura sets out to solve this and other problems (Col. 6, Lines 10-20) by leveling the color filter surface for a uniform surface and to prevent a barrel-shaped section (Col. 3, Lines 1-5 et seq.). Varying cell thickness and the barrel-section allows light to pass through and thus does not improve contrast (Col. 3, Lines 1-13). Thus, the color filter layers overlap to improve the contrast because light does not pass through and contrast is improved along with good display quality. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Ogura for surface smoothness with a view to improving contrast and display quality (Col. 6, Lines 20-25).

Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US 6,407,782 B1) as applied to claim 13 above and further in view of Nakamura et al. (US 5,725,975).

Per claim 14 (amended): Kim does not appear to have the steps of forming a color filter material over the substrate, patterning the color filter material by using a mask having a transparent pattern, a semitransparent pattern, and an opaque pattern, wherein the semitransparent pattern is used for forming the peripheral portion of each color filter; however, Nakamura teaches a gradation mask of three different regions varying in transparency (please see Figure 5B). In region “c” of Figure 5B, the transmittance of light of a wavelength of 365 nm was 100% while in region “b” transmittance was about 10% (Col. 6, Lines 30-37). Nakamura also teaches that this gradation mask is very suitable for the manufacturing of color filters comprising a plurality of colored pixels (Col. 6, Lines 61-63). The teaching of Nakamura suggests that this

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type of gradation mask is suitable for the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Kim in view of Nakamura for the formation of color filters because light of a given wavelength can be transmitted depending on the region or area of the mask (thus a color filter, green, blue, or red could be formed depending on the degree of transparency of a given region) and this mask would be very efficient for the formation of color filters because each color filter could be manufactured at one time without the need for separate masks.

Conclusion

Based upon Applicant's amendments of all claims, this action is made final. Applicant has not presently amended the claims (1-14) to place the claims in condition for allowance.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (703)305-7009. The examiner can normally be reached on M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-8741 for regular communications and (703)746-8741 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Jeanne Andrea Di Grazio

Robert Kim, SPE

JDG
June 18, 2003


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